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 "On the forms of some Compounds of Thallium." By W. H. MILLER, M.A., For. Sec. R.S., Professor of Mineralogy in the University of Cambridge. Received December 13, 1865.

Nitrate of Thallium.

Prismatic, 0 1 0, 0 1 1=38° 8'·1; 1 0 0, 1 1 0=62° 56'·3.

100,011	9ů ó
100,110	62 56.3
100,210	44 23
100,111	68 6.5
100,211	5 1 13
110,111	34 57.5
011,011	103 44
011,211	38 47
110, 110	54 7.4
210,211	28 46
$210, \overline{2}10$	91 14
011,111	21 53.5
$111, \bar{1}11$	43 47
$111, 1\overline{1}1$	93 44.8
111, 111	110 5
$211, \overline{2}11$	77 34
$211, 2\overline{1}1$	75 38
$211, \bar{2}\bar{1}1$	122 28

Fig. 1.

Observed combinations:—100, 111; 100, 111, 211; 100, 011, 111, 211; 100, 110, 210, 111, 211; 100, 011, 110, 210, 111, 211.

No cleavage observable.

From the observed minimum deviation of the brightest part of the solar spectrum formed by refraction through the faces 100, $\overline{1}10$, it appears that the index of refraction of a ray in the plane 001, and polarized in that plane, is about 1.817. The refrangibility of the other ray is greater, its minimum deviation through the same faces being 93° nearly.

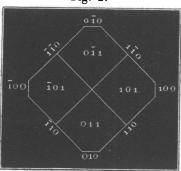
Sulphocyanide of Thallium.

Pyramidal, 0 0 1, 1 0 1=38° 20'·3. Observed forms:—1 0 0, 1 1 0, 1.0 1.

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Fig. 2.

100,010	9°0	ó
100,110	45	0
100,011	90	0
100, 101	5 l	39.7
110,101	63	59
101, 101	76	40.6
101,011	52	2



Observed combinations:—110,101;100,110,101.

The crystals are remarkable for the very unequal extension of the faces of the same simple form, and at first sight look as if they belonged to the oblique system. The breadth and thickness of one of the largest crystals were 1·1 and 0·055 millimètre respectively; and of two adjacent faces of the form 1 0 1, one was about eleven times the breadth of the other. The distribution of the large and small faces did not appear to be subject to any law; so that these crystals cannot be regarded as combinations of large and small hemihedral forms.

Twins. Twin face 101.

101, 101	180°	ó
110,011	52	4
110,011	-52	4
011,110	75	56
011, [10	7 5	56
101, <u>1</u> 0 ι	26	38.8

Fig. 3.

No cleavage observable.

An attempt was made to determine the optical constants of the crystal by observing the minimum deviation of light refracted through a face of the form 1 1 0 and one of the opposite faces of the form 1 0 0; the latter were, however, so small that the observation could not be made with much accuracy. It appeared that for the ordinary ray polarized in a plane parallel to the line 0 0 1, the indices of refraction of red light, of the brightest part of the spectrum, and of violet light were about 2·115, 2·159, and 2·314 respectively, and that, for the extraordinary ray polarized in the plane 0 0 1, the indices of refraction of red light, the brightest part of the spectrum, and of violet light were about 1·890, 1·973, and 2·143 respectively.

Carbonate of Thallium.

The faces which have been observed are all in one zone, and exhibit a symmetry which is compatible with either the prismatic or the oblique system. The crystals probably belong to the prismatic system. They are aggregated in such a manner as to render it very difficult to isolate a single crystal, or to determine the faces which belong to the different individuals of a group of crystals.

Observed forms:—100, 110, 210, 120.

Fig. 4.

100,110	5 i 2 s
100,210	32 7
100,120	68 57
$110, \bar{1}10$	77 4



Twins. Twin face 1 1 0. One individual is generally united to each of two others, in this respect resembling the twins of cerussite, aragonite, glaserite, and chrysoberyl.

A cleavage has been observed probably parallel to the faces of the form 1 1 0; it may, however, be parallel to the faces of the form 1 0 0, the complexity of the twin crystals being such that it could not be ascertained whether the cleavages observed belonged to one crystal or to two different crystals.

I am indebted to Mr. Crookes, the discoverer of thallium, for the crystals of nitrate, sulphocyanide, and carbonate of thallium, above described.